

DOCKET NO.: 215878US99DIV

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: : EXAMINER

JAMAL RAMDANI

SERIAL NO.: NEW DIVISIONAL APPL. :

FILED: HEREWITH : GROUP ART UNIT

FOR: SEMICONDUCTOR STRUCTURE, SEMICONDUCTOR DEVICE,
COMMUNICATING DEVICE, INTEGRATED CIRCUIT, AND PROCESS
FOR FABRICATING THE SAME

PRELIMINARY AMENDMENT

Sir:

Prior to examination on the merits Applicants request entry of the following
amendment.

IN THE INVENTORSHIP

A separate paper deleting Kurt W. Eisenbeiser has been submitted herewith.
His invention is not being claimed herein.

IN THE CLAIMS

Please cancel Claims 1-143.

Please add new 144-163 as follows:

--144. A semiconductor structure comprising:

a monocrystalline silicon substrate;

an amorphous oxide material overlying the monocrystalline silicon substrate;

a monocrystalline perovskite oxide material overlying the amorphous oxide material; and

a monocrystalline compound semiconductor material overlying the monocrystalline perovskite oxide material.

145. The semiconductor structure of claim 144 wherein the monocrystalline silicon substrate is orientated in the (100) direction.

146. The semiconductor structure of claim 144 further comprising a template layer formed between the monocrystalline perovskite oxide material and the monocrystalline compound semiconductor material.

147. The semiconductor structure of claim 144 further comprising a buffer material of monocrystalline semiconductor material formed between the monocrystalline perovskite oxide material and the monocrystalline compound semiconductor material.

148. The semiconductor structure of claim 147 further comprising a template layer formed between the monocrystalline perovskite oxide material and the buffer material.

149. The semiconductor structure of claim 147 wherein the buffer material is selected from the group consisting of: Germanium, a $\text{GaAs}_x\text{P}_{1-x}$ superlattice where x ranges from 0 to 1, an $\text{In}_y\text{Ga}_{1-y}\text{P}$ superlattice where y ranges from 0 to 1, and an InGaAs superlattice.

150. The semiconductor structure of claim 144 wherein the monocrystalline perovskite oxide material is selected from the group consisting of: alkaline earth metal titanates, alkaline earth metal zirconates, alkaline earth metal hafnates, alkaline earth

metal tantalates, alkaline earth metal ruthenates, alkaline earth metal niobates, alkaline earth metal vanadates, alkaline earth metal tin based perovskites, lanthanum aluminate, and lanthanum scandium oxide.

151. The semiconductor structure of claim 144 wherein the monocrystalline perovskite oxide material comprises $\text{Sr}_z\text{Ba}_{1-z}\text{TiO}_3$ wherein z ranges from 0 to 1.

152. The semiconductor structure of claim 144 wherein the monocrystalline compound semiconductor material is selected from the group consisting of: III-V compounds, mixed III-V compounds, II-VI compounds, and mixed II-VI compounds.

153. The semiconductor structure of claim 144 wherein the monocrystalline compound semiconductor material is selected from the group consisting of: GaAs, AlGaAs, InP, InGaAs, InGaP, ZnSe, AlInAs, CdS, CdHgTe, and ZnSeS.

154. A semiconductor structure comprising:

- a monocrystalline substrate characterized by a first lattice constant;
- a monocrystalline insulator layer having a second lattice constant different than the first lattice constant overlying the monocrystalline substrate;
- an amorphous oxide layer between the monocrystalline substrate and the monocrystalline insulator layer; and
- a monocrystalline compound semiconductor layer having a third lattice constant different than the first lattice constant overlying the monocrystalline insulator layer;

wherein the second lattice constant is selected to be one of:

- equal to the third lattice constant; and
- intermediate the first and third lattice constant.

155. The semiconductor structure of claim 154 wherein the monocrystalline substrate is orientated in the (100) direction.

156. The semiconductor structure of claim 154 wherein the amorphous oxide layer has a thickness sufficient to relieve strain in the monocrystalline insulator layer.

157. The semiconductor structure of claim 154 further comprising a template layer between the monocrystalline insulator layer and the monocrystalline compound semiconductor layer.

158. The semiconductor structure of claim 154 further comprising a buffer layer between the monocrystalline insulator layer and the monocrystalline compound semiconductor layer.

159. The semiconductor structure of claim 154 wherein the monocrystalline substrate is characterized by a first crystalline orientation and the monocrystalline insulator layer is characterized by a second crystalline orientation and wherein the second crystalline orientation is rotated with respect to the first crystalline orientation.

160. The semiconductor structure of claim 154 wherein the monocrystalline substrate comprises silicon.

161. The semiconductor structure of claim 154 wherein the monocrystalline substrate comprises a material comprising silicon, the monocrystalline insulator comprises an alkaline earth metal titanate and the monocrystalline compound semiconductor material comprises a material selected from the group consisting of: GaAs, AlGaAs, ZnSe, and ZnSeS.

162. The semiconductor structure of claim 161 wherein the monocrystalline insulator layer comprises $\text{Sr}_z\text{Ba}_{1-z}\text{TiO}_3$ where z ranges from 0 to 1.

163. The semiconductor structure of claim 154 wherein the monocrystalline insulator layer comprises an oxide selected from the group consisting of alkaline earth metal zirconates, and alkaline earth metal hafnates and the monocrystalline compound semiconductor layer comprises a material selected from the group consisting of: InP and InGaP.

REMARKS

New claims 144-163 added above find support throughout the specification and in the original claims. See, for example, original claims 1, 8, 25, 26 and 29, as well as the Examples appearing at specification pages 8-12 and the detailed description appearing at pages 13-20. Note also Figure 3 and pages 13-14 in relation to new claim 154. In view of the ample support present herein, no new matter has been entered.

In view of the above amendment Applicant submits that the present application is in condition for examination on the merits, and early notification to this effect is respectfully requested.

Respectfully submitted,

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Claims 1-143 (Canceled)

Claims 144-163 (New)